Discussion Questions

The following discussion questions have been prepared to provide a framework for key discussion topics during this workshop. Feedback before or after the workshop is welcome, and can be directed to Johanna Levine at jlevine@arb.ca.gov, for the medium- and heavy-duty hybrid vehicle regulation, or Jessica Dean at jdean@arb.ca.gov, for updates to the heavy-duty hybrid vehicle test procedures.

Development of New Hybrid Requirements for Medium- and Heavy-Duty Vehicles

1. How should a "hybrid" vehicle be defined?

In general, a hybrid vehicle is defined as any vehicle that can draw propulsion energy from both of the following on-vehicle sources of stored energy: 1) consumable fuel, and 2) a rechargeable energy storage system. Hybrid technology is quickly advancing and ARB needs to ensure that any hybrid vehicle definition is broad enough to encompass future technology developments and different types of hybrid vehicles, but descriptive enough to ensure legitimate technologies are used for regulatory compliance.

2. Who should the regulated entity be?

ARB will be evaluating different ways to structure this regulation. Current emission standards for medium- and heavy- duty vehicles are imposed on the engine manufacturer, while fleet operators are regulated on the make-up of their in-use fleet. ARB is evaluating several approaches to achieve a simple, enforceable, and cost-effective regulation. One approach would be to regulate the vehicle owner (e.g. when purchasing a new vehicle, a hybrid vehicle would need to be purchased). While this is a fairly simple option, the large number of regulated entities would require a large enforcement effort. Another option would be to regulate the truck manufacturer. This option would be more complicated since the engine, chassis, and body might be manufactured by different companies.

3. How would the vocations be identified and defined if a phased-in regulatory approach is employed?

Hybrid technology provides the greatest benefit when used in vocational applications that have significant urban, stop-and-go driving, idling, and PTO operations in their duty cycle. These applications include, but are not limited to, parcel delivery vans and trucks, utility trucks, garbage trucks, transit buses, and other vocational work trucks. If a phased-in approach is used, a comprehensive list of appropriate vocations will need to be identified. Current medium- and heavy-duty inventory data is not parsed based on vocation. The Hybrid Truck and Bus Voucher Incentive Project will provide some vocational data, but will not be comprehensive in the timeframe necessary for initial regulatory development.

Updates to the Interim Certification Procedures for 2004 and Subsequent Model Year Hybrid-Electric Vehicles, in the Urban Bus and Heavy-Duty Vehicle Class

1. What parts of the current hybrid test procedure (TP) could be reasonably updated?
The current TP has been in place since 2002. While ARB's certifications staff has experience on this topic, we'd like input from manufacturers and assemblers who have used the test procedures as far as proposed improvements. Could they be updated to accommodate new technology or new standard practices? Are there obstacles that can be reduced or eliminated?

2. What is the most practical test method for measuring GHGs?
The current TP was not designed to address greenhouse gases (GHG), which AB 32 (California Global Warming Solutions Act of 2006) specifically directs ARB to reduce. ARB is currently reviewing published literature on the topic. We'd like input from those who have used or developed published (and unpublished) test methods for measuring GHGs.

3. What duty cycle(s) will best represent the vehicles being tested?
Hybrid emissions reductions vary by work cycle or duty cycle. How can the test procedure represent the various duty cycles completed by different types of hybrid vehicles (ie, delivery van vs. work truck vs. line-haul truck). One or several duty cycles may be necessary. Selection of the duty cycle(s) may also be influenced by types of vehicles regulated.

4. Will new or emerging hybrid configurations require different test procedures?
Many types of hybrid vehicle configurations exist, including variations which may or may not affect vehicle emissions. This question directly relates to the definition of "hybrid" and tolerances within the certification procedure. ARB is reviewing published literature on the topic, but again, would appreciate input.